

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method for characterizing a tissue, the method comprising:
 - obtaining features of a Raman spectrum of the tissue in a first wavelength range;
 - obtaining features of a background fluorescence spectrum of the tissue in a second wavelength range overlapping with the first wavelength range, wherein the background fluorescence spectrum is a background to the Raman spectrum in the first wavelength range; and,
 - characterizing the tissue based upon at least the Raman spectrum features and the background fluorescence spectrum features.
2. (Original) A method according to claim 1 wherein the first and second wavelength ranges include wavelengths in the near infrared.
3. (Cancelled)
4. (Previously Presented) A method according to claim 1 wherein the first and second wavelength ranges each include wavelengths from about 800 nm to about 1000 nm.
5. (Previously Presented) A method according to claim 1 wherein obtaining features of the background fluorescence spectrum and the Raman spectrum comprise illuminating the section of

tissue with incident light that is substantially monochromatic and obtaining a raw spectrum by detecting light backscattered from the tissue at a plurality of infrared wavelengths.

6. (Original) A method according to claim 5 wherein the Raman features include a peak at a Raman shift of 1445 cm⁻¹ relative to a wavelength of the incident light.
7. (Previously Presented) A method according to claim 5 wherein the Raman features include a peak at a Raman shift of 1269 cm⁻¹ relative to a wavelength of the incident light.
8. (Previously Presented) A method according to claim 5 wherein the Raman features include features within a band having a Raman shift in the range of about 1200 cm⁻¹ to about 1400 cm⁻¹ relative to a wavelength of the incident light.
9. (Previously Presented) A method according to claim 5 wherein the Raman features include features within a band having a Raman shift in the range of about 1500 cm⁻¹ to about 1650 cm⁻¹ relative to a wavelength of the incident light.
10. (Original) A method according to claim 1 wherein obtaining features of the background fluorescence spectrum comprises illuminating the tissue with infrared light and obtaining a raw spectrum by detecting light backscattered from the tissue at a plurality of infrared wavelengths.
11. (Original) A method according to claim 10 wherein obtaining features of the Raman spectrum comprises extracting the features of the Raman spectrum from the raw spectrum.

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12. (Original) A method according to claim 11 wherein extracting the features of the Raman spectrum from the raw spectrum comprises fitting a background fitting function to the raw spectrum to yield a fitted background function and subtracting the fitted background function from the raw spectrum.
 13. to 14. (Cancelled)
 15. (Original) A method according to claim 12 wherein obtaining features of the background fluorescence spectrum comprises obtaining features of the fitted background function.
 16. (Original) A method according to claim 10 wherein characterizing the tissue based upon at least the Raman spectrum features and the background fluorescence spectrum features comprises applying to the raw spectrum a classification function derived from principal components analysis.
 17. (Original) A method according to claim 1 wherein characterizing the tissue based upon at least the Raman spectrum features and the background fluorescence spectrum features comprises applying to one or more datasets a classification function derived from principal components analysis, the one or more datasets collectively including the Raman spectrum features and the background fluorescence spectrum features.

18. (Original) A method according to claim 17 wherein the one or more datasets include one or more Raman spectrum PC scores and one or more background fluorescence spectrum PC scores.
19. (Original) A method according to claim 17 wherein applying the classification function comprises applying a predetermined principal component to data of the one or more datasets.
20. (Original) A method according to claim 17 wherein the tissue is skin of a part of a subject's body and the method comprises selecting a classification function corresponding to the part of the subject's body from a plurality of classification functions each corresponding to a different body region.
21. (Original) A method according to claim 20 wherein the plurality of classification functions includes classification functions corresponding to two or more of the following body parts: head, torso, hand, and arm or thigh.
22. (Cancelled)
23. (Original) A method according to claim 1 wherein characterizing the tissue comprises applying the Raman spectrum features and the background fluorescence spectrum features as inputs to a neural network.
24. (Previously Presented) A method according to claim 1 where the section of tissue is a section of skin.

25. (Previously Presented) A method according to claim 1 wherein the section of tissue comprises lung tissue.
26. (Previously Presented) A method according to claim 1 wherein the section of tissue comprises epithelial tissue.
27. (Original) A method according to claim 26 wherein the epithelial tissue comprises tissue lining the subject's gastrointestinal tract.
28. (Original) A method according to claim 26 wherein the epithelial tissue comprises a lining of the subject's ear, nose or throat.
29. (Previously Presented) A method according to claim 1 applied to screening for skin cancer.
30. (Previously Presented) A method according to claim 1 applied to screening for one or more conditions selected from the group consisting of: basal cell carcinoma, squamous cell carcinoma, melanoma, actinic keratosis, seborrheic keratosis, sebaceous hyperplasia, keratoacanthoma, lentigo, melanocytic nevi, dysplastic nevi, and blue nevi.
31. (Cancelled)
32. (Previously Presented) A method according to claim 1 wherein the Raman features include one or both of: a peak at a Raman shift of 1445 cm^{-1} relative to a wavelength of the incident light and a peak at a Raman shift of 1269 cm^{-1} relative to a wavelength of the incident light and wherein characterizing

the tissue comprises indicating whether the tissue is likely affected by melanoma.

33. (Previously Presented) A method according to claim 1 wherein the Raman features include one or both of: a peak at a Raman shift of 1445 cm^{-1} relative to a wavelength of the incident light and a peak at a Raman shift of 1269 cm^{-1} relative to a wavelength of the incident light and wherein characterizing the tissue comprises indicating whether the tissue is likely compound nevus tissue.
34. (Currently amended) A method according to claim 1 wherein the features of the Raman and ~~autofluorescence~~fluorescence spectra are acquired with the tissue *in vivo*.
35. (Currently amended) A method according to claim 34 wherein the tissue is located below a tissue surface and acquiring the features of the Raman and ~~autofluorescence~~fluorescence spectra comprises detecting light from the tissue after the light has passed through overlying tissue.
36. to 39. (Cancelled)
40. (Previously Presented) A method according to claim 1 wherein the tissue is tissue of a subject and the method comprises:
obtaining features of at least one of a Raman spectrum and a background fluorescence spectrum of a control area of normal tissue of the subject;
wherein characterizing the tissue is based, in part, upon a difference between one or more features of the Raman and background fluorescence spectra of the tissue and

corresponding one or more features of the Raman and background fluorescence spectra of the control area.

41. to 47. (Cancelled)

48. (New) A method according to claim 5 comprising:

computing the melanin content of the tissue based upon intensities of first and second peaks at Raman shifts of approximately 1368 cm^{-1} and 1572 cm^{-1} in the Raman spectrum,

wherein characterizing the tissue based upon at least the Raman spectrum features and the background fluorescence spectrum features comprises characterizing the tissue based upon at least the computed melanin content.

49. (New) Apparatus for characterizing tissues, the apparatus comprising:

a light source for illuminating a section of tissue;
an optical system configured to collect and direct backscattered light from the section of tissue into a spectrometer;

a data processor connected to receive spectrum information for the backscattered light from the spectrometer, the spectrum information including information about features of a Raman spectrum of the section of tissue in a first wavelength range of the backscattered light and information about features of a background fluorescence spectrum of the section of tissue in a second wavelength range of the backscattered light, the second wavelength range overlapping with the first wavelength range, wherein the background fluorescence spectrum is a background to the Raman spectrum in the first wavelength range;

wherein the data processor is configured to characterize the section of tissue based upon at least the Raman features and the background fluorescence features of the section of tissue.

50. (New) Apparatus according to claim 49 comprising at least one classification function accessible to the data processor, the classification function producing a classification result in response to an input, the input including information about at least one Raman feature and at least one background fluorescence feature of a spectrum of a tissue;

wherein the data processor is configured to apply the classification function to the spectrum information to obtain a corresponding classification result and to generate an output based upon the corresponding classification result, the output indicative of whether the section of tissue is likely to include abnormal tissue.

51. (New) Apparatus according to claim 50 comprising a plurality of classification functions and a mechanism for permitting a user to select an appropriate one of the classification functions.